REMARKS

Claims 1-23, 28, 78 and 79 are rejected under 35 U.S.C. 112 as being indefinite. These claims are now believed to comply with 35 U.S.C. 112.

Specifically, the lack of antecedent basis for the limitation "in the network" in Claims 1 and 28 have been remedied by deleting the term "environment."

The limitations "each title is divided" and "in the titles" have been amended as suggested by the Examiner. The limitation in Claim 1 of "for transmitting data in the titles to the proxy server" is believed to be clear in its meaning. This relates to the "transmission bit rate" of claim 1. By caching certain identified sub-blocks, the method of claim 1 reduces the "transmission bit rate ... for transmitting data in the titles to the proxy server."

All of the claims listed above are believed to comply with 35 U.S.C. 112.

The Examiner is of the opinion that "at least some titles" in Claim 28 are indefinite. We believe otherwise. It is believed that 35 U.S.C. 112 does not require an applicant to specify exactly how many titles are referred to in claims. The same can be said for the limitation in Claim 29 that has been amended to refer to "some but not all of the units". The limitation which has been objected to in Claim 29 has been deleted, so that it is believed to comply with 35 U.S.C. 112.

Claims 1-23, 28-63, 69-73 and 78-83 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,815,622 to Ong. Claim 4, 32, 33, 44 and 71 have been cancelled. The rejection is traversed insofar as it is applied to the remaining claims as amended.

Before the specific rejection is discussed, it is worthwhile to first review the various features of the method of Claim 1. Some of these features are illustrated in Figs. 3A and 3B and in the specification from pages 18 through 20.

Referring to Fig. 3A, the squares labeled "0" to "8" in the top plot or graph are nine data blocks from a media data title to be transmitted sequentially to a client or customer in accordance with a time schedule labeled "original data delivery" above the plot. When these data blocks are received by a customer or client, these data blocks are then "consumed," such as by being displayed on a display device such as a television or computer monitor, or by means of any other type of rendering system. As will be evident from the top plot or graph in Fig. 3A, in order for the full data block to be transmitted to a customer or client through a communication channel, such as a network, the data rate that the communication channel needs to support is at least "r."

This is the data rate required to support a single data stream between the source of the data blocks and one client. Often times, a number of different clients or customers may be requesting many video media titles at the same time, so that the communication channel will be required to support a number of different data streams. This means that the data rate of the channel, in order to deliver the media according to the delivery schedule, must have a data rate many times "r." The example in Fig. 3A is in reference to a single data stream only.

Thus Approach A, in Fig. 3A and described in the specification pages 18 through 20, proposes to cache a data block every N blocks (where N is 4 in Fig. 3A). Thus as shown in Approach A, the data blocks labeled "0", "4" and "8" are cached at a proxy server so that they are not shown in Approach A of Fig. 3A, whereas blocks labeled "1" through "3" and "5" through "7" will still be fetched from the central server and sent to the proxy server. In this approach, the central server would send the six blocks ("1"-"3" and "5"-"7") to the proxy server and the proxy server would then combine the six data blocks together with the three cached ("0", "4" and "8") and send all nine data blocks to the client. However, in this approach, it will be seen that according to the original data delivery schedule, during the time periods when blocks 0, 4 and 8 are to be transmitted to the client, the central server will remain idle since these blocks are fetched from the proxy server. However, during the other six time periods the central server would still be required to deliver data at a data rate of "r", so that the peak data rate required of the central server to be transmitted in the backbone connection from the central server to the proxy server is not reduced at all.

The various limitations in Claim 1 enable the data rate of the backbone connection between the central server and the proxy server to be reduced. This is illustrated, for example, in the embodiment labeled Approach C in Fig. 3A. Rather than caching the entire data block out of every N data blocks as in Approach A, in Approach C, a portion of each of the data blocks is cached at a proxy server. This is illustrated in the embodiment of Fig. 3B, although the scope of the rejected claims is not limited to such embodiment.

Fig. 3B illustrates 100 data blocks labeled v_i^1 to v_i^{100}, although only four data blocks are illustrated in Fig. 3B (v_i^1, v_i^2, v_i^j and v_i^{10}). Each of the 100 data blocks is divided into ten sub-blocks. Rather than caching the entire block as in Approach A, in Approach C, only the first sub-block of each of the 100 data blocks are cached, where the 100 cached sub-blocks are labeled collectively as unit 132a. If it turns out that this particular media title is in high demand,

the second group or unit 134a of sub-blocks comprising the second sub-blocks of all the 100 blocks may be cached as well. This process may continue until more of the sub-blocks of the 100 blocks are cached. Since the sub-blocks 132a, 134a and so on are cached at the proxy server, only the remaining sub-blocks of the 100 data blocks would need to be delivered from the central server to the proxy server through the backbone network connection. This effectively reduces the data rate required in the backbone connection. The sub-blocks that would need to come from the central server then form partial data blocks and are labeled "0'" through "8'" in Fig. 3A under the label Approach C.

As graphically illustrated in Fig. 3A, since a portion of each of the data blocks is cached in the proxy server as illustrated above in reference to Fig. 3B, only partial data blocks will need to be delivered from the central server to the proxy server. For this reason, the partial data blocks "0'" through "8'" are shown to be flatter and smaller than the data blocks under Approach A. Thus if one-quarter of each of the data blocks has been cached at a proxy server, then only three-quarters of each of the data blocks would need to be delivered from the central server to the proxy server, resulting in a data rate of "0.75r" instead of "r." as in Approach A. This shows that the peak data rate of the backbone connection between the central server to the proxy server would be reduced. While in the practical example described above, equal numbers of sub-blocks are cached from each of the data blocks, this is not required and the specification clearly specifies that this is not required to retain the advantages of the invention. See, for example, page 18 lines 1-4.

With the above preface, we are now ready to return to the specific rejection. Claim 1 has now been amended to clearly specify that some but not all sub-blocks in each of the blocks of at least one media data title are cached at a proxy server computer system, and further that the cached sub-blocks at a proxy server computer system are combined with sub-blocks of the media data title not cached at a proxy server computer system (and transmitted from the central server computer system to the proxy server computer system) and delivered to clients. Claim 1 further specifies that this causes a peak transmission rate in the backbone network connection (for the central server computer system to transmit data to the proxy server computer system) which is reduced. Ong clearly fails to teach or suggest these features.

Claim 1 is directed to a method employing an architecture where a central server computer system is connected to a proxy computer system via a backbone connection in a

network. Ong is directed to a system where data blocks originally stored on the disk drive are cached at a buffer memory when such data blocks are requested close enough in time from different customers. The disk drive is of course different from the central server computer system of Claim 1. The buffer memory is also different from the proxy server computer system of Claim 1. Furthermore, the disk drive and the buffer memory of the media server 10 are not connected together by a backbone network connection. Ong fails to teach or suggest such features of claim 1.

In addition, Ong fails to teach or suggest dividing each data block into sub-blocks and caching some but not all of the sub-blocks of each data block at a proxy server computer system. Ong merely teaches the caching of complete data blocks in an approach similar to Approach A described above in reference to Fig. 3A of the present application. In other words, the approach adopted by Ong fails to reduce the peak transmission rate of the connection between original storage device (disk drive in the case of Ong) and the media server. In contrast, in the case of Claim 1, the peak transmission rate between the central server and a proxy server computer system is reduced.

Furthermore, since the main storage in Ong is a disk drive, Ong's concern is to reduce the number of disk access so as to speed up the delivery to clients. Ong simply fails to teach or suggest the concept of reducing a peak transmission rate in the connection between the central storage device and the caching device. In other words, during each disk access in Ong, the data delivery rate between the disk drive and the media server will not be reduced by the caching of data blocks at the media server irrespective of how many data blocks are cached.

From the above, it is evident that there is no identity of elements between Ong and Claim 1 so that Ong fails to anticipate Claim 1. Furthermore, in view of the vast differences between Ong and Claim 1, it is further believed that there is no reason or motivation for one skilled in the art to modify Ong in order to arrive at the features of Claim 1. Claim 1 is therefore believed to be allowable.

For reasons similar to those discussed above in Claim 1, Claims 28 and 86 are likewise believed to be allowable.

Claims 29, 38, 41 and 68 share with claim 1 the overall architecture where a central server computer system is connected to a proxy computer system via a backbone connection in a network, and therefore distinguish over Ong on that basis. Moreover, claims 29, 38, 41 and 68

all contain the limitation that the sub-blocks or units cached by the proxy server computer system comprise partial information of video frames that are transmitted sequentially. These claims also contain the limitation that the proxy server computer system combines the cached partial information of video frames with complimentary partial information of such video frames from the central server computer system into complete video frames and sends the complete video frames to the terminal devices. Ong fails to teach or suggest such features. Ong fails to describe any type of video frames, and is apparently silent on what the composition of the data blocks stored may look like in the disk drive or buffer memory. In fact, Ong contains no disclosure on splitting up the data blocks in any fashion. Ong merely stores some of the data blocks of popular video titles at the buffer memory, so as to reduce the frequency of disk access.

Therefore Ong fails to anticipate Claims 29, 38, 41 and 68. Again because of the vast differences between these four claims and Ong, there is no reason or motivation for one skilled in the art to modify Ong in order to arrive at the features of these four claims. Claims 29, 38, 41 and 68 are therefore believed to be allowable.

Claims 2, 30, 39, 42 and 69 are rejected in view of Ong. The rejection is respectfully traversed. The Examiner relies on column 2, lines 30-67 of Ong as teaching the feature in these claims that the time period for caching is independent of time. We disagree. In contrast, Ong clearly states that the "oldest-in-time" data blocks are removed to free a section of the memory buffer. See column 2, line 61. Ong therefore teaches the opposite of what is claimed in these rejected claims.

As for Claims 5, 45 and 46, Ong also fails to teach or suggest features in these claims. Thus the section referred to by the Examiner in Ong (column 3, lines 42-45 and column 4, lines 1-10 and 45-60) fail to teach or suggest such features. In fact, Ong simply does not refer to video frames or partial information of video frames at all. If the Examiner disagrees, it is respectfully requested that he indicate exactly where such disclosure can be found in such sections of Ong.

As for Claims 17 and 57, the Examiner is of the opinion that Ong in column 4, lines 18-45 teaches the features of these claims. We disagree. In fact, Ong in column 4, line 23, clearly indicates that the "oldest-in-time" data blocks are removed instead of the "most recently cached portions" in Claims 17 and 57. Ong therefore teaches away from Claims 17 and 57.

The rejected dependent claims are also believed to be allowable since they depend from allowable claims 1, 28, 29, 38, 411-3, 5-23, 28-31, 34-43, 45-63, 68-73 and 80-90and 68.

Claims 3, 10, 31 and 40 are rejected under 35 USC 103 as unpatentable over Ong in view of Tanaka (US 5, 610,841) The rejection is respectfully traversed. Tanaka stores all of the sub-blocks in the same hard disk in the same MSFS (media segment file server), and not in any intermediary location such as the SCBs 3000 etc. Tanaka (col. 4, lines 5-10, 58-61) fails to disclose the feature of these claims that the same number of sub-blocks from each block are cached at the proxy server. This has the advantage that the peak data rate is reduced by the most, given the total number of sub-blocks that are cached. If the Examiner disagrees, it is respectfully requested that he indicate exactly where such disclosure can be found in such sections of Tanaka or Ong.

The Examiner has also failed to give any convincing reason or motivation for the combination urged in combining Ong and Tanaka. To provide a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to those skilled in the art, to modify the reference or to combine the references. MPEP 2143. The section quoted by the Examiner from Ong, col. 2, lines 23-27 (reduce unnecessary accesses, minimizing peak-use data loadings) do not support the combination, where this feature enables an efficient way of reducing the peak data rate, a feature that is unrelated to the reasons given by the Examiner. If the Examiner disagrees, it is respectfully requested that he indicate exactly why such reasons support the rejection. For reasons similar to those above for claims 3, 10, 31, 40, claim 50 is likewise believed to be allowable.

Claims 6, 7 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ong and U.S. Patent 6,570,579 to MacInnis et al. The rejection is respectfully traversed. We argued in prior amendments that MacInnis is non-analogous art and should, therefore, be removed as a reference. The Examiner has failed repeatedly to respond to our views and in fact issued a final action while ignoring our arguments. We requested in our November 2004 amendment that this be responded to, and the Examiner has again failed to do so in the present action. Our arguments are set forth again for the Examiner's convenience. We request again that this be responded to.

A reference is non-analogous art if it is not within the field of endeavor of the invention of the rejected claim and not reasonably pertinent to the particular problem within which the

inventors are involved. *In re Deminski,* 230 USPQ 313 at 315 (Fed.Cir. 1986). It is believed that MacInnis is non-analogous art and should, therefore, be removed as a reference. MacInnis relates to a graphic display system such as one used in a set-top box for controlling a television display, where the goal is to "provide a high level of system performance while conserving memory bandwidth and chip size." (see Abstract). It is, therefore, clearly outside of the field of endeavor with respect to the invention of the rejected claims, which relates to a system whereby the transmission rate of titles from a central server can be reduced. The particular problem with which the inventors are involved is the reduction of transmission rates that is required from a central server. MacInnis is, therefore, also not pertinent to the particular problem with which the inventors are involved and should, therefore, be removed as a reference.

Even assuming *arguendo* that MacInnis may be considered, we believe that the combination of MacInnis with Ong still fails to render these claims obvious. MacInnis discloses a graphic display system that combines graphics and video data from different sources to provide a blended output. Col. 1, lines 59-65. In other words, the data that is blended together are from different sources, rather from the same set of video frames as in claims 6, 7 and 47. In these claims, the video frame is divided into two sets of partial information: each containing complementary partial information of the same video frames (e.g. two sets of complementary scan lines of the frame). One set of partial information is cached at the proxy server computer system, and the other is sent over from the central server computer system. The features relied on by the Examiner in MacInnis merely relate to system features for processing video scan lines; they simply do not even remotely resemble those of the rejected claims. Moreover, the reason given by the Examiner (sending video and graphics data in real time) does not support the combination of Ong and MacInnis. As noted above, Ong fails to disclose any composition of his data blocks, and failed therefore to disclose the video frames of these claims. Ong also fails to mention any combination of video and graphics data from different sources as in MacInnis. If the Examiner disagrees, it is respectfully requested that he indicate exactly why such reasons support the rejection.

Claims 33-35 contain limitations similar to those described above in Claims 5-7.

Claims 8, 36, 48 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ong and U.S. Patent 6,636,222 to Valmiki et al. These claims are believed to be allowable since

they depend from allowable claims and since Valmiki et al. fail to remedy the deficiencies of Ong described above.

Claims 13-16 and 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ong and U.S. Patent 5,568,181 to Greenwood et al. The rejection is respectfully traversed. The rejected claims are believed to be allowable since Greenwood fails to remedy the deficiencies described above in Tanaka.

Claims 20-22, 28 and 60-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ong and U.S. Patent 6,435,057. The rejection is respectfully traversed. The rejected claims are believed to be allowable since they depend from allowable claims and since they contain limitations, which are not taught or suggested by either reference. Thus, Claim 20 contains "defining a time window ending at a time of the caching replacement." This feature is absent from Ong as well as the '057 patent (column 4 or elsewhere of the '057 patent). Claim 22 contains the feature that the time weighting is in favor of accesses occurring more recently in the window. This is not taught or suggested by either reference. Column 8, Lines 5-25 of the '057 patent fails to describe such feature. If the Examiner disagrees, it is respectfully requested that the Examiner point out exactly which line in this column of the '057 patent teaches such features. The Examiner has apparently failed to do so despite our request in our April 2004 amendment.

Claims 60-62 contain limitations similar to those of Claims 20-22 discussed above.

New claims 84-90 have been added to more completely cover the invention.

Claims 1-3, 5-23, 28-31, 34-43, 45-63, 68-70, 72-73, and 80-90 are presently pending.

CONCLUSION

In view of the amendments and remarks contained herein, it is believed that all claims are in condition for allowance and an indication of their allowance is requested. However, if the Examiner is aware of any additional matters that should be discussed, a call to the undersigned attorney at: (415) 318-1162 would be appreciated.

Respectfully submitted,

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